FIELD MODIFICATION FORM
FOR
CORNELL DUBILIER ELECTRONICS SUPERFUND SITE: OU4 BOUND BROOK
THE LOUIS BERGER GROUP, INC.

DATE: April 5, 2012 (revision 1)

DOCUMENT: Quality Assurance Project Plan
Cornell Dubilier Electronics Superfund Site: OU4 Bound Brook

ACTIVITY: Field Modification No. 7
Modeling Data Needs

REQUESTED MODIFICATION:

On behalf of the United States Environmental Protection Agency (EPA) and the United States Army Corps of Engineers (USACE), The Louis Berger Group, Inc. (Berger) and ARCADIS/Malcolm Pirnie, Inc. are conducting a Remedial Investigation / Feasibility Study (RI/FS) of Bound Brook in Middlesex County (New Jersey), which is designated as Operable Unit 4 (OU4) of the Cornell Dubilier Electronics Superfund Site. According to the "Final Quality Assurance Project Plan (QAPP)" (dated October 2010), real-time modifications to the project can be implemented by documenting the modification and obtaining approval from the Project Manager and Site Quality Control Officer or designee (refer to Worksheet #6). Field Modification No. 7 addresses data needs for the hydrodynamic and sediment transport models.

The goal of the Bound Brook model is to identify and predict areas of the brook (*i.e.*, bank-to-bank sections or reaches) experiencing net solids deposition and erosion. It is not the intent of the model to track localized deposition and erosion events. Consequently, a one-dimensional model will provide suitable predictions on the brook's hydraulics and solids transport. The one-dimensional model will simulate the transport of solids from upstream sources, transport of bed and suspended solids loads, and the effects of an armored surface sediment layer on flow. The model will then be used to estimate possible channel scour during large flood events, evaluate areas of net deposition or erosion, evaluate deposition of solids in New Market Pond, and, if the need arises, predict the influence of bank-to-bank dredging on the rate of deposition in the brook.

It is anticipated that the USACE model "Hydrologic Engineering Centers River Analysis System" (HEC-RAS; a one-dimensional, numerical model) will be used to model the hydraulics and solids transport on Bound Brook. Since HEC-RAS requires hydrological boundary conditions, Berger will use the output from a watershed model as input into HEC-RAS. The proposed watershed model (which will simulate surface water runoff and loading of solids from the watershed to Bound Brook) is the Soil Water Assessment Tool (SWAT), a continuous time model. SWAT will be used to directly predict the flow and solids movement from the watershed to Bound Brook and to predict the long-term impacts of gradual solids buildup and transport out of the watershed sub-basins directly to Bound Brook. To simulate watershed conditions, meteorological data (precipitation, evaporation, and evapotranspiration), watershed hydrologic soil group data, and watershed land use data will be needed. Meteorological data will be downloaded from the National Oceanic and Atmospheric Administration - National Climatic Data Center (NOAA-NCDC).

In accordance with QAPP Modification No. 1 (dated April 2011), nine data loggers are installed on Bound Brook and its tributaries to continuously collect water elevation data to calibrate the hydraulic model. These elevation data are supplemented by manual flow measurements collected during high flow and low flow events. Together, these data provide a correlation between water level and flow on the brook. The model is also supported by elevation data of the brook. Figure 1 shows the 45 locations where a cross-sectional elevation survey will be conducted, extending 50 feet on either side of the channel.[1] The survey will also include surveying culverts, bridge pilings, spillways, storm pipes, culverts, end walls, head walls, and other features within the channel that may impact the hydrodynamics of the brook.

Solids transport within the brook will be modeled using the Sediment Impact Analysis Method (SIAM) with HEC-RAS. Sediment deposition or erosion can be estimated by comparing the solids budget between cross-sectional elevation locations. The model is calibrated with suspended solids measurements under different flow regimes. To construct a correlation of flows versus suspended solids, total suspended solids (TSS) samples will be collected during a storm event on the "rising" hydrograph. A suitable storm that would trigger mobilization for sampling is a single event with greater than 0.75 inches of precipitation within 12 hours (with a 3-day antecedent dry event).

Samples will be collected from bridges using a bottle-immersion technique. Bridge locations include Bound Brook Bridge [approximately river mile (RM) 0.4], South Avenue Bridge (RM2.1), Clinton Avenue Bridge (RM5.2), and Belmont Avenue Bridge (RM6.8). A total of 40 TSS samples will be collected, which consists of 10 samples from each of the four bridge locations. The TSS samples will be temporally placed throughout the hydrograph. Samples will be processed following Field Modification No. 2 (dated September 2011) and analyzed by Accutest Laboratories (Dayton, New Jersey) with the following modification: extra volume will be shipped (approximately 4 liters per sample) to ensure that sufficient solids are present in the sample to report a detectable concentration for each field sample. Prior to the collection of each TSS sample, a water quality measurement using a Horiba U22/U52 probe will be recorded. The probe measures pH, conductivity, turbidity, dissolved oxygen, temperature, water depth, salinity, total dissolved solids, specific gravity, and oxidation-reduction potential. For samples collected at the Bound Brook Bridge, a field measurement will be recorded measuring the brook water elevation on the bridge gauge.

RATIONALE:

Field Modification No. 7 addresses data needs for the hydrodynamic and sediment transport models. Two site-specific correlations are required to calibrate the models: water level versus flow (discussed in QAPP Modification No. 1) and suspended solids versus flow (presented in this Field Modification No. 7).

ATTACHMENTS:

Figure: Cross-Sectional Elevation Locations (to be surveyed)

[1] Figure 4 of QAPP Modification No. 1 presented "proposed" and "optional" cross-sectional elevation locations. Field Modification No. 7 provides the final transect locations that are being surveyed in winter 2011.

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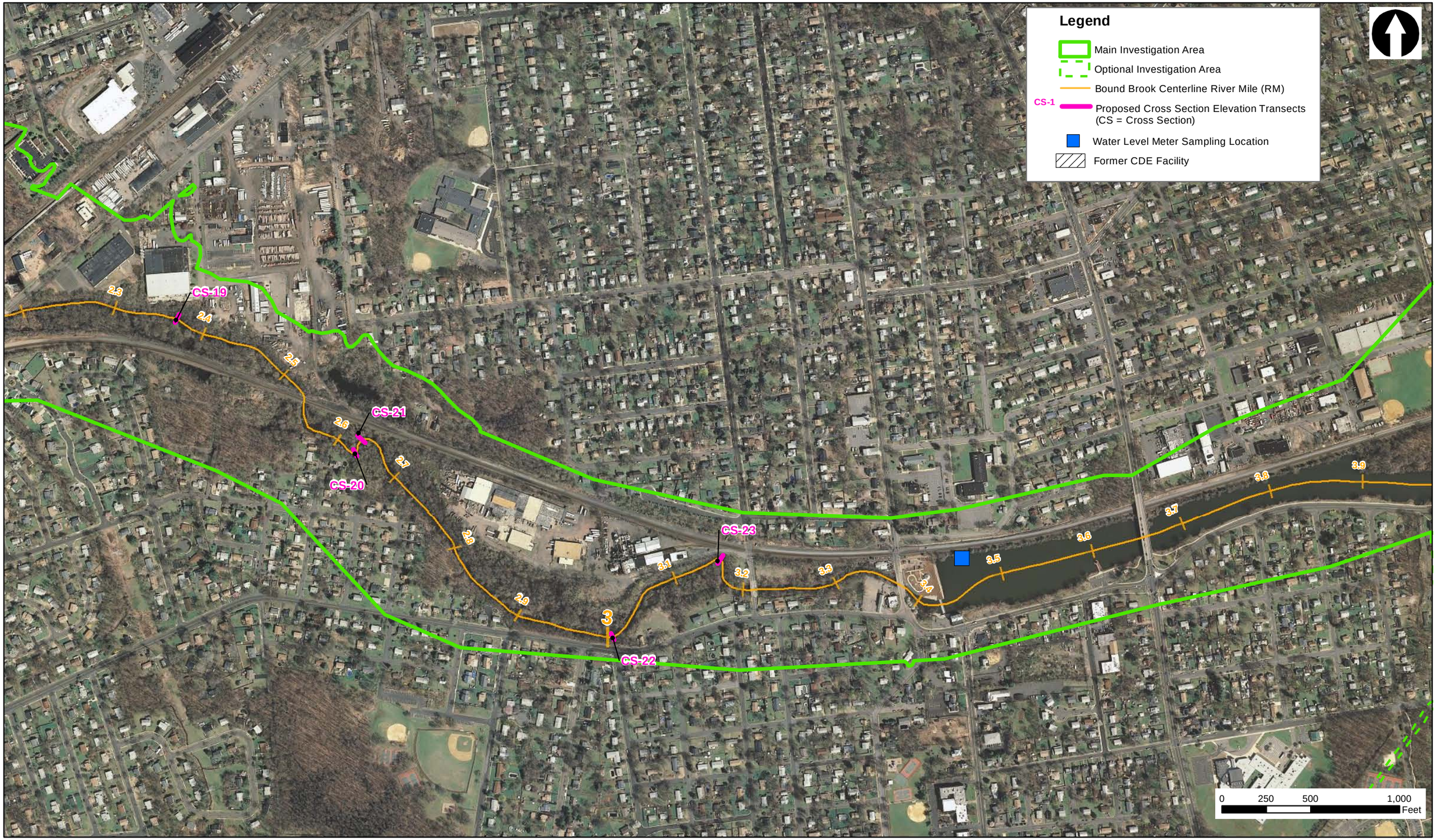
MALCOLM PIRNIE	Cornell-Dubilier Electronics Superfund Site South Plainfield, New Jersey	**Water Level Meter Locations and Cross-Section Elevation Transects** *Bound Brook Remedial Investigation/Feasibility Study*	November 2011 Figure 1



Cornell-Dubilier Electronics
Superfund Site
South Plainfield, New Jersey

Water Level Meter Locations and Cross-Section Elevation Transects
Bound Brook Remedial Investigation/Feasibility Study

November 2011

Figure 2

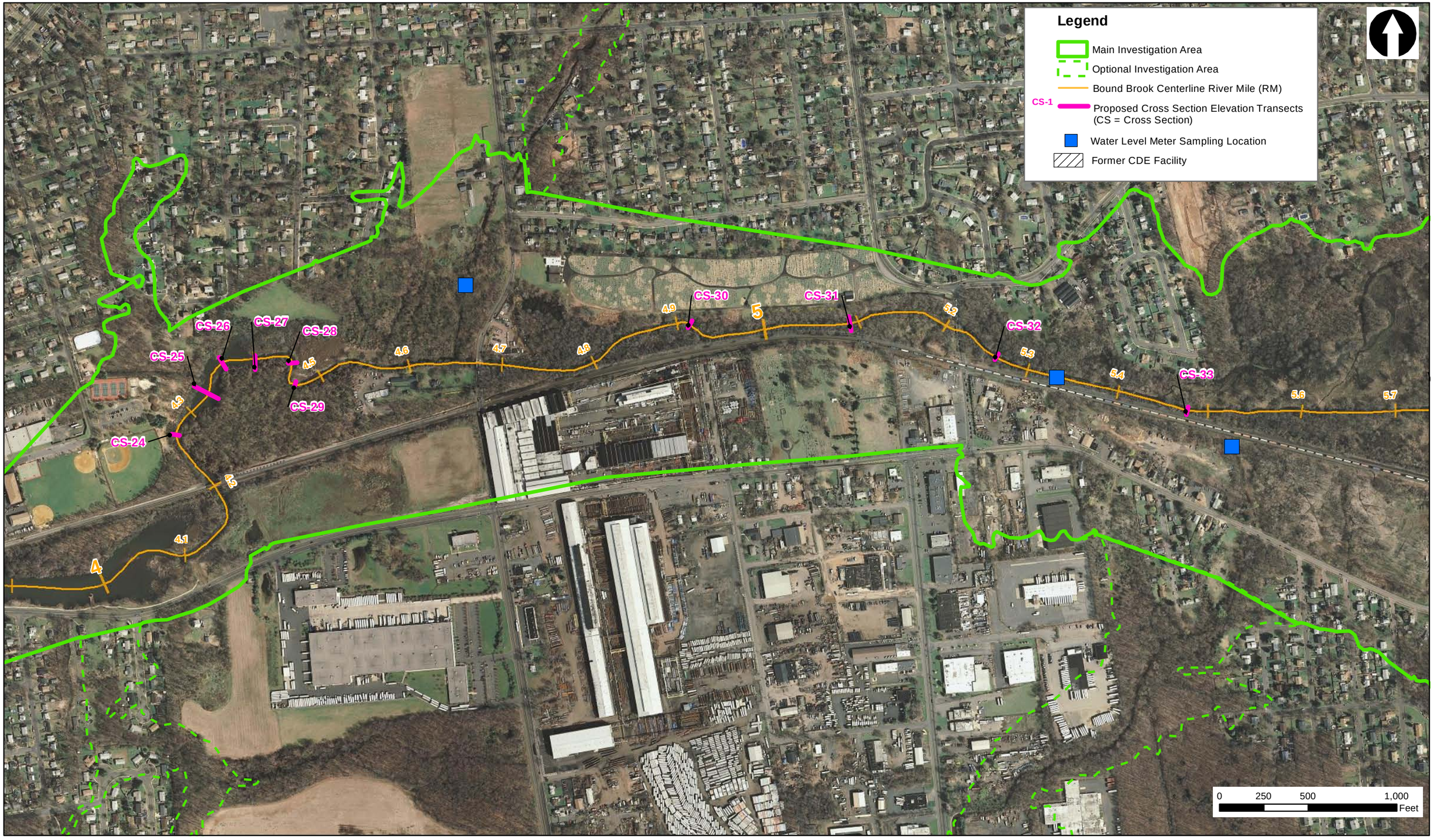


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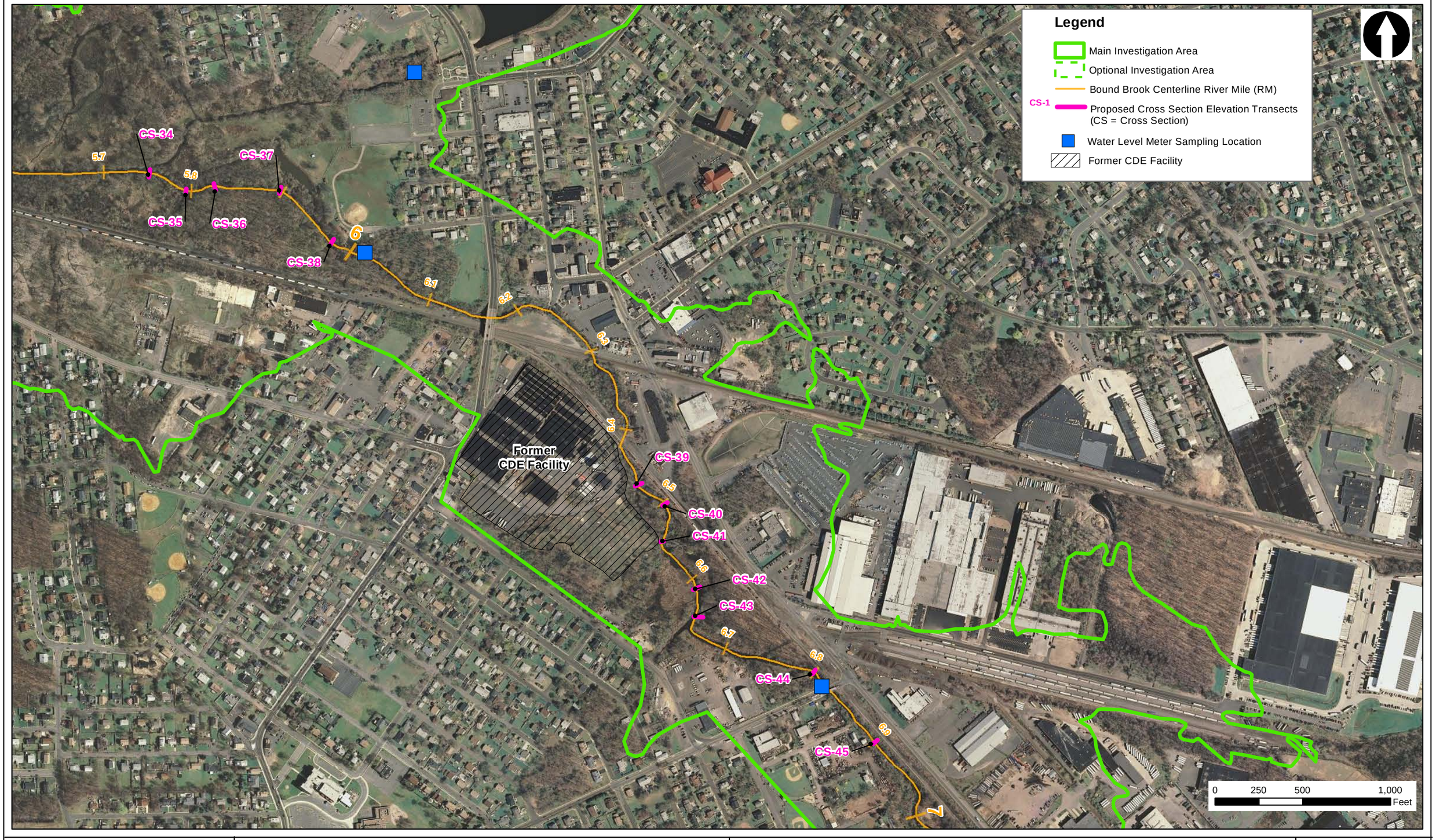
Figure 3



LB / MALCOLM PIRNIE	Cornell-Dubilier Electronics Superfund Site South Plainfield, New Jersey	**Water Level Meter Locations and Cross-Section Elevation Transects** *Bound Brook Remedial Investigation/Feasibility Study*	November 2011 Figure 4